SOME AVIAN AND FISH NEMATODES, CHIEFLY FROM TAILEM BEND, SOUTH AUSTRALIA

By T. HARVEY JOHNSTON AND PATRICIA M. MAWSON, University of Adelaide.

Fig. 1–7.

Unless otherwise indicated, the nematodes recorded in this paper were collected by the senior author from material obtained in the swamps at Tailem Bend, Murray River, South Australia, during the past nine years. We are indebted to the kindness of Messrs. G. G., F. and B. Jaensch and Mr. L. Ellis, of Tailem Bend, for their help in securing the hosts; and to the Commonwealth Research Grant to the University of Adelaide for financial assistance. Types of the new species have been deposited in the South Australian Museum.

HOST-PARASITE LIST.

BIRDS.

Chenopis atrata Lath.: *Amidostomum cygni* Wehr.
Microcarbo melanoleucus Vieill.: *Contracaecum* sp.
Phalacrocorax carbo Linn.: *Contracaecum spiculigerum* Rud.
Pelecanus conspicillatus Temm.: *Contracaecum* sp.
Larus novaehollandiae Stephens: *Capillaria laricola* (Wassilkowa).
Chlidonias leucopareia Temm.: *Contracaecum* sp.
Notophoyx novaehollandiae Lath.: *Contracaecum* sp.
Podiceps ruficollis Stephens (var. novaehollandiae): *Streptocara recta* (Linst.).
Biziura lobata Shaw: *Amidostomum biziurae* n. sp.
Eudyptula minor Forst.: *Contracaecum eudyptulae* J. and M. (Kangaroo Island).
Gymnorhina hypoleuca Gould: *Capillaria gymnorhinae* n. sp. (Adelaide).

FISH.

Craterocephalus fluviatilis McCulloch: *Eustrongylides gadopsis* J. and M.
Plectroplites ambiguus Rich: *Contracaecum* sp., larvae; *Ascarophis murrayensis* n. sp.; *Goezia fluviatilis* J. and M.; *Spinitectus plectroplites* J. and M. (syn. *S. percalates* J. and M.); *Capillaria plectroplites* J. and M.
Percalates colonorum Gunther: *Spinitectus plectroplites* J. and M.; *Goezia fluviatilis* J. and M., larvae.

MCCULLOCHELLA MACQUARIENSIS C. and V.: *Goezia fluviatilis* J. and M., larvae; *Contracaecum* sp., larvae.

THERAPON (BIDYANA) BIDYANA Mitchell: *Contracaecum* sp. larvae.

PHILYPNODON GRANDICEPS Krefft: *Contracaecum* sp., larvae; *Eustrongylides gadopsis* J. and M., larvae (record omitted from our previous host list, J. and M., 1944, 60).

TANDANUS TANDANUS Mitchell: *Capillaria tandani* J. and M.; *Goezia fluviatilis* J. and M.; *Procamallanus* sp.; *Contracaecum* sp., larvae.

PSEUDAPHRITIS URVILLII C. and V.: *Ascarophis* sp., larvae; *Eustrongylides gadopsis* J. and M., larvae; *Procamallanus murrayensis*, J. and M.

NANNOPERCA AUSTRALIS Gunther: *Ascarophis* sp., larvae; *Contracaecum* sp., larvae.

GALAXIAS OLIDUS Gunth.*: *Contracaecum* sp., larvae; *Eustrongylides gadopsis* J. and M., Coorong.

NEMATALOSA EREBI Gunther: *Contracaecum* sp. larvae.

MUGILOGOBIUS GALWAYI McCull. and Waite: *Contracaecum* sp., larvae.

RETROPINNA SEMONI Weber: *Eustrongylides* sp. (probably *E. gadopsis*), larvae.

SALMO FARIO Linn.*: *Eustronglylides gadopsis* J. and M., larvae, from Cooma and Bombala, New South Wales, and from Canterbury Province, New Zealand.

*Material from host species indicated in this report by an asterisk was collected in localities other than the Tailem Bend region.

EUSTRONGYLIDES GADOPSIS Johnston and Mawson.

Larval worms of this species (of which we regard our *E. galaxias* as a synonym) were recovered from *Pseudaphritis urvillii, Craterocephalus fluviatilis, Galaxias olidus* and *Philypnodon grandiceps.* Very young larvae of *Eustrongylides* sp., probably *E. gadopsis,* were found in *Retropinna semoni.* We remarked previously (J. and M., 1944, 64) that this larval parasite was almost certainly the young stage of *E. phalacrocoracis,* occasionally found in the wall of the stomach of local cormorants.

We have identified the larva from material taken from the brown trout, *Salmo fario,* forwarded to us for identification from Cooma and Bombala, New South Wales, and from Canterbury Province, New Zealand.

CAPILLARIA GYMNORHINAE n. sp.

(Fig. 1.)

Two female Capillariids were taken from the magpie, *Gymnorhina hypoleuca,* from the Adelaide district. They measure 12–12·5 mm. in length; the breadth at the head is 15·6μ, at the base of the oesophagus 80–90μ, and at the widest part of the body, 132μ. Bacillary bands are absent. The ratio of the lengths of the oesophageal and intestinal parts of the body is 1 : 3·7. The vulva lies just behind the oesophagus. The eggs (fig. 1) are thin-shelled, and measure 50μ by 25μ.

The worms do not agree with *C. pomatostomi* J. and M., 1945 (differing in the size of the eggs and in the ratio of the body parts); nor with *C. graucalina* J. and M., 1941 (differing in egg size); nor with *C. grallinae* J. and M., 1945 (which differs in the ratio of the body parts).

CAPILLARIA LARICOLA (Wassilkowa).

(Fig. 2.)

One female Capillariid worm was taken from a gull, *Larus novaehollandiae.* Its measurements fall within the limits given by Freitas and Lent (1935) in their redescription of *C. laricola* (Wassilk., 1930). The total length is 14·7 mm.; the breadth at the head 14μ, at the base of the oesophagus 76μ, and at the widest part 99μ (which is rather narrower than has been stated for the species). The eggs are 60μ by 30μ, and are smooth-shelled, without prominent polar plugs. Bacillary bands are present.

CAPILLARIA TANDANI Johnston and Mawson 1940.

(Fig. 4.)

This species was originally described from four females from the catfish, *Tandanus tandanus.* In the present collection a male worm is present. It is 3·3 mm. long. The posterior end of the oesophagus is indistinct, so that the ratio of the anterior to the posterior part of the body is uncertain. The breadth at the head is 10μ, and at the widest part of the worm, 54μ. The stout spicule is 225μ long. The spicule sheath, partly everted and obscuring the bursa, is markedly annulate. A figure of the wrinkled egg shell is given (fig. 3).

CAPILLARIA PLECTROPLITES J. and M. 1940.

(Fig. 3.)

From *Plectroplites ambiguus.* The species was originally described from females from this host species, and male worms from *Percalates colonorum* were also referred to *C. plectroplites.* In the present collection are males and females, the males agreeing with those described from *P. colonorum.* The spicule sheath is not spinous. Two bacillary bands are present, each consisting of two rows of sparsely scattered papillae.

AMIDOSTOMUM CYGNI Wehr 1933.

(Fig. 5.)

A single male worm was taken from the black swan, *Chenopis atrata*. The extreme posterior end is apparently damaged but the characters of the spicules and of the anterior end indicate that the parasite belongs to the genus *Amidostomum*. The total length is 6·8 mm., and that of the oseophagus, ·744 mm. The excretory pore is 171μ from the anterior end. The buccal capsule is stout-walled, its internal diameter 21μ, and its depth 12μ; it contains three teeth, one larger than the other two. The spicules, each of which is complex and terminates in two unequal prongs, are 153μ long. The canoe-shaped gubernaculum is 72μ long.

The bursa is absent, presumably having been torn off at its base.

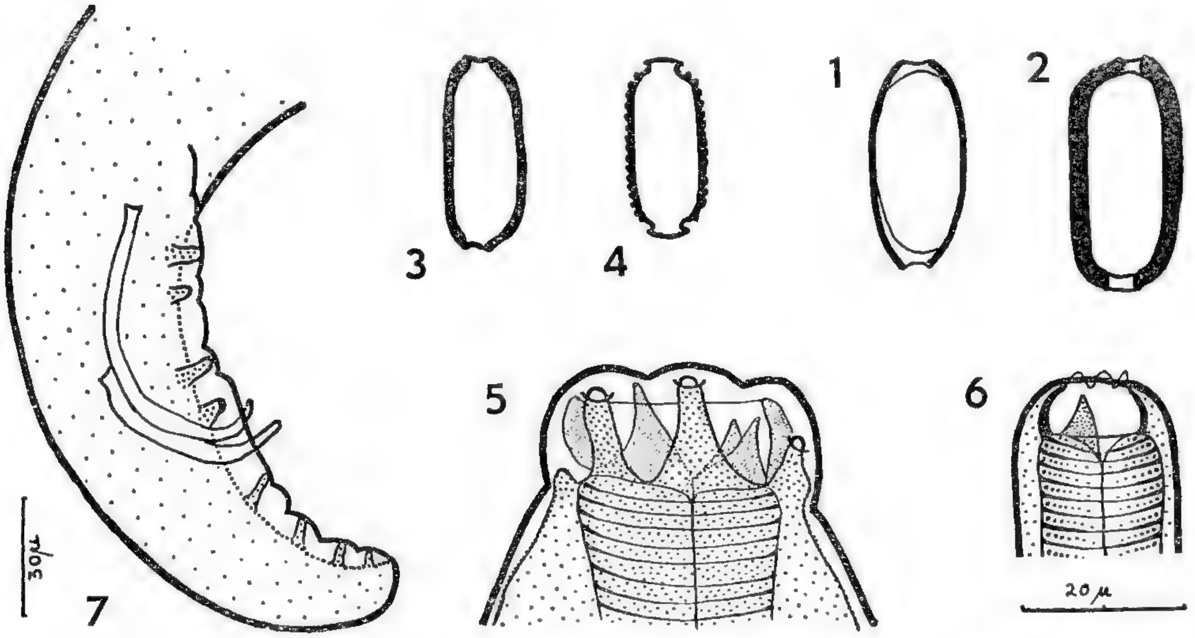

Fig. 1. *Capillaria gymnorhinae*, egg. Fig. 2. *Capillaria laricola*, egg. Fig. 3. *Capillaria plectroplites*, egg. Fig. 4. *Capillaria tandani*, egg. Fig. 5. *Amidostomum cygni*, head. Fig. 6. *Amidostomum biziurae*, head. Fig. 7–8. *Ascarophis murrayensis*: 7, anterior end; 8, posterior end of male. Fig. 1–4, drawn to the same scale; fig. 5 and 6 to same scale.

The specimen agrees with *A. anseris* (Zeder) R. and H. 1909, *A. spatulum* Baylis 1932, and *A. cygni* Wehr in having three teeth. Its spicules and gubernaculum are much shorter than those of the first two of these species. The worm differs from *A. anseris* also in the size of the teeth relative to that of the buccal capsule, and from *A. spatulum* in the absence of any "epaulette" structures. It is a rather shorter worm than *A. cygni*, but the proportions of the various parts are similar. In the absence of a bursa it is impossible to verify the identification completely, but we suggest that our specimen belongs to *A. cygni*.

AMIDISTOMUM BIZIURAE n. sp.

(Fig. 6.)

A single female worm referable to the genus *Amidostomum* was taken from the musk duck, *Biziura lobata*. Its measurements and characters were not found to correspond with those of any known species of the genus, and a brief description is now given.

The total length is 7·9 mm., that of the oesophagus is indeterminable. The buccal capsule is thin-walled, about 11μ wide, 7μ deep, and contains one large tooth. Its upper edge appears to be prolonged into six small digitiform projections. The vulva is 1·7 mm. from the posterior end. The eggs are $65–75\mu$ by 37μ.

Though the material on which the description is based is so scanty, the status of a new species is suggested for it, as being convenient for future reference.

CONTRACAECUM SPICULIGERUM (Rud.).

This common nematode, already reported as occurring in the stomach of various Australian cormorants, is now recorded from *Phalacrocorax carbo* from Tailem Bend, where the bird is not often seen. The parasite was mentioned previously from this host species in New South Wales by Johnston (1912, 75) as *Ascaris* sp.

CONTRACAECUM EUDYPTULAE J. and M.

This parasite has been taken from a penguin, *Eudyptula minor*, from Kangaroo Island.

CONTRACAECUM spp.

Nematodes belonging to the same genus have been obtained from a number of birds and fish. In some cases the material was recognisable and has already been recorded, but in many cases the worms were too young or too poorly preserved for satisfactory identification and are here listed as *Contracaecum* sp. The bird hosts were *Pelecanus conspicillatus*, *Microcarbo melanoleucus*, *Chlidonias leucopareia*, *Notophoyx novaehollandiae* and *Egretta alba*.

Very young worms were found sparingly in the mesentery and omentum adjacent to the stomach and upper intestine of the following fish: *Plectroplites ambiguus*, *Therapon bidyana*, *Philypnodon grandiceps*, *Tandanus tandanus*, *Galaxias olidus*, *McCullochella macquariensis*, *Nannoperca australis*, *Nematalosa erebi* and *Mugilogobius galwayi*. These small transparent worms are probably the larva of *C. spiculigerum* from cormorants and *C. bancrofti* from pelicans.

GOEZIA FLUVIATILIS J. and M. 1940.

This short, thick, maggot-like nematode was described originally (J. and M. 1940, 342) from *Plectroplites, McCullochella* and *Percalates;* and larval stages were recorded from *Nannoperca* and *Tandanus* from Tailem Bend and from *Mogurnda adspersa* from the Burnett River, Queensland. We have identified the species from *Plectroplites ambiguus* from the Thompson River at Longreach, Western Queensland; and in a dead specimen of the same species of fish from Murray Bridge we found that the liver was extensively burrowed by adults of the parasite.

Larval stages have now been collected from the omentum of *Percalates colonorum* and *McCullochella macquariensis*, from both of which fish adults had previously been collected. Very small larvae are to be found in *Tandanus tandanus* occupying spherical, or somewhat flattened and lenticular, pedunculated cysts, measuring about ·35 mm. in diameter and each containing a larva about ·8 mm. in length.

SPINITECTUS PLECTROPLITES J. and M. 1940.

Syn. *S. percalates* J. and M. 1940.

From *Plectroplites ambiguus.* The species was described originally from females only; but males have now been collected from the type host, and have been found to agree in length and in the features of the posterior end, as well as other characters, with those of *S. percalates.* The latter species was differentiated from *S. plectroplites* by the length of the vestibule in relation to the position of the first ring of spines and to the width of the head. Among the large numbers of specimens now available for study, all from *Plectroplites ambiguus*, are female and male worms with the type of head described as *S. plectroplites;* others with that described as belonging to *S. percalates*; as well as others with more or less intermediate characters. It is therefore suggested that the differences may be due to the state of contraction of the worm, or that the character may be variable within the species. In all other respects the worms are similar. *S. percalates* thus falls as a synonym of *S. plectroplites.*

ASCAROPHIS MURRAYENSIS n. sp.

(Fig. 7–8.)

From the callop, *Plectroplites ambiguus.*

Female, 3·1–5·4 mm. long; vestibule 90–93μ long; anterior narrower part of oesophagus ·13–·19 mm. long, posterior part ·4–·8. Nerve ring at ·1 mm. and excretory pore at ·13 mm. from head end respectively. Vulva at about middle of body. Eggs, 28μ × 19μ.

Male, 2·8–3 mm. in length; vestibule ·1 mm. long; anterior part of oesophagus ·14 mm., posterior part ·6 mm. long; excretory pore ·17 mm. behind head. Spicules, 50μ and 100μ long. Caudal alae somewhat narrow for the genus, supporting four pairs of preoral and five pairs of postanal papillae. The ventral surface around the cloaca is beset with small cuticular tubercles.

Larval worms, often encysted, and of a type referred to in a previous paper (J. and M. 1941, 260) under *Acuaria* (s.l.) sp., larvae, as having been recovered from two birds and from *Retropinna semoni*, are now recorded from various hosts, namely *Nannoperca australis*, *Pseudaphritis urvillii*, and *Plectroplites ambiguus*. These worms are also very like certain larvae from fish from subantarctic waters recorded in B.A.N.Z.A.R.E. Reports (J. and M. 1945). Without infection experiments, it is probably impossible to tell which are the larvae of *Ascarophis* sp. or *Spinitectus* spp. from fish, and which of them belong to Acuariids living as adults in birds. Most of the known Acuariid life histories however involve an arthropod intermediate host, so it is probable that larvae found in fish will grow to the adult stage in the same host.

STREPTOCARA RECTA (Linst).

Streptocara recta (Linst) is again recorded from *Podiceps ruficollis novaehollandiae*. The measurements of the single female in this collection are as follows: body length 5·2 mm.; length of vestibule 27μ; length of anterior part of oesophagus ·25 mm., of posterior part 1·2 mm.; vulva 2 mm. from posterior end of body; eggs 35μ by 18μ.

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